9/21/09
(5)

We Can Make Places in Acton Better with Sidewalks

Here's How

A Draft Guideline for Acton Sidewalk Design

by the Sidewalk Committee, Town of Acton
with help from Town Staff, the Design Review Board, the Transportation Advisory Committee, and Town Citizens

A Draft Guideline for Acton Sidewalk Design

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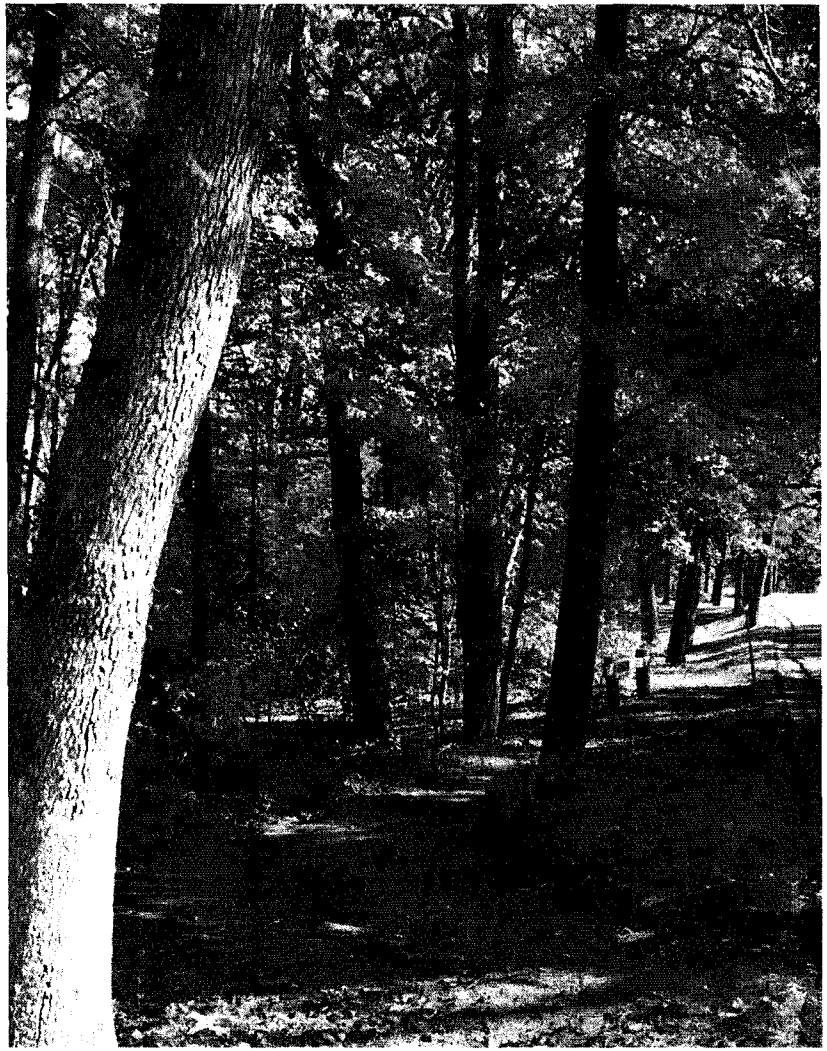
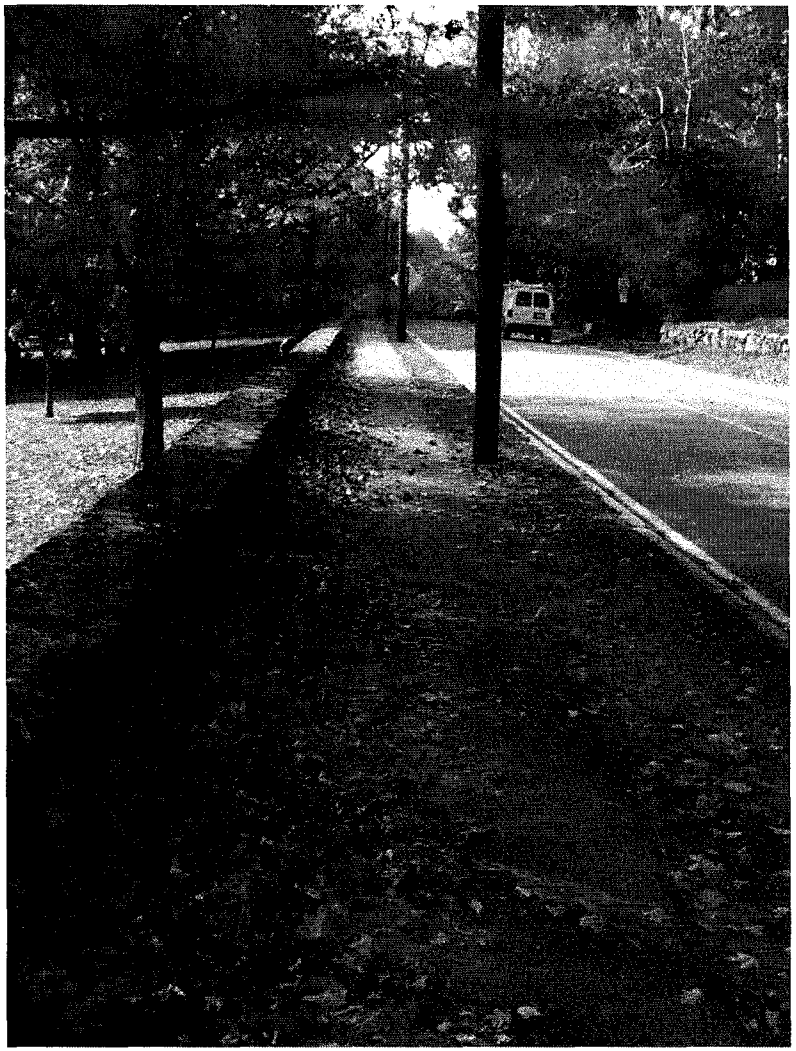
Summary of Sidewalk Design Goals :

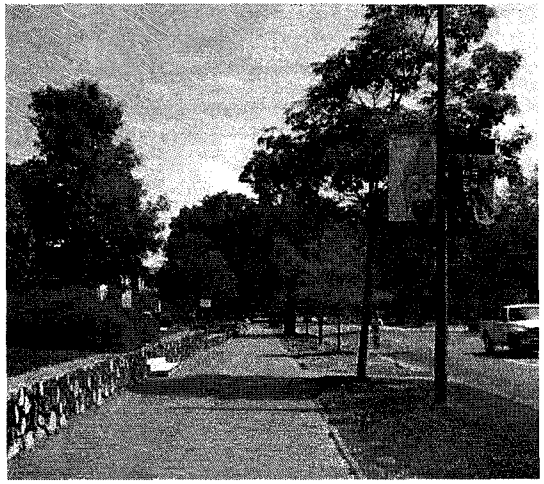
- Pleasurable and safe walking experience for all populations
  - protected from road traffic
  - attractive landscaping and/or interesting views
- Contextual sensitivity
  - in keeping with the nature of the area – whether rural, historic, commercial, residential, wooded, or wetlands
  - design materials and design approach consistent with what's already in place
- Ease of maintenance during different seasons
- Longevity of materials
- Environmental sensitivity
  - preservation and enhancement of existing landscape (e.g. preserving trees and/or planting new appropriate trees)
  - protecting wetlands from storm water runoff and road pollutants
- Cost appropriate

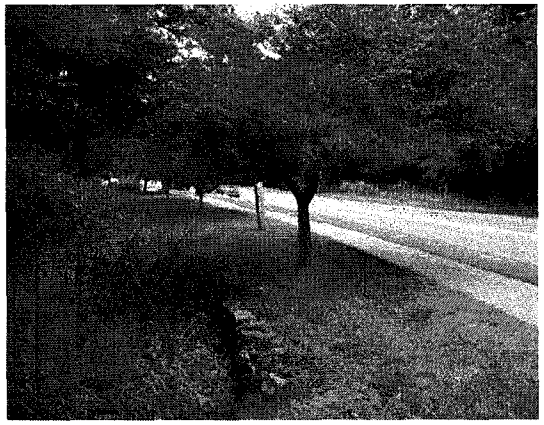
A well-designed sidewalk looks like it belongs





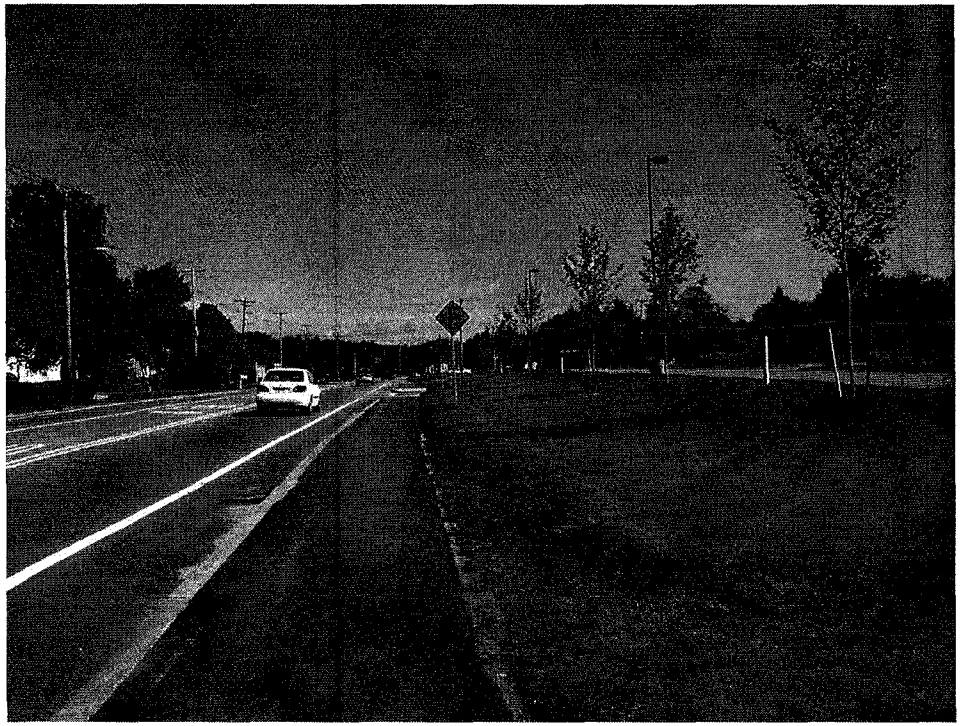
Grass, shade trees, or parked cars protect walkers from traffic



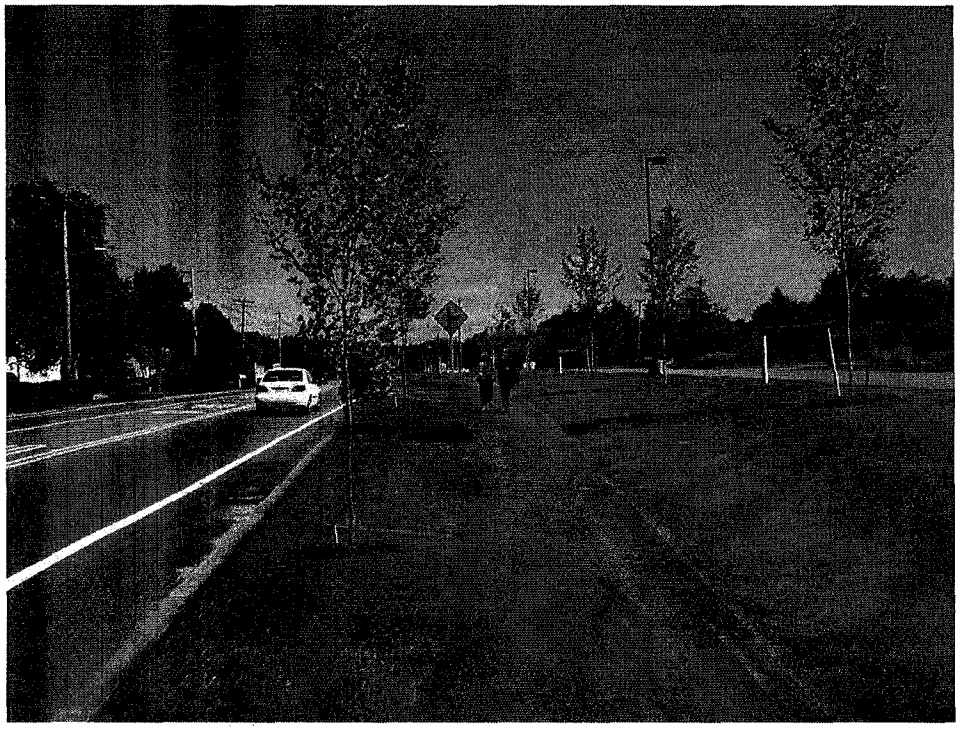


And can significantly enhance a neighborhood

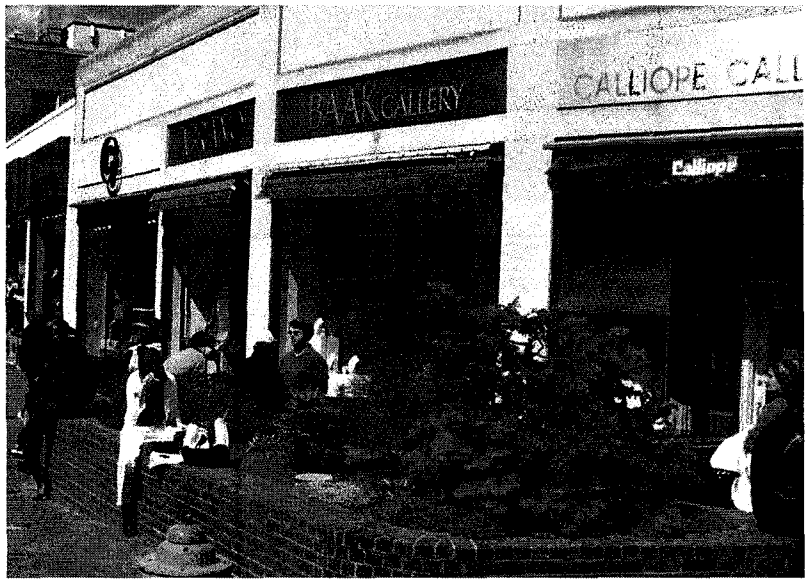
Rte 2A - What got built

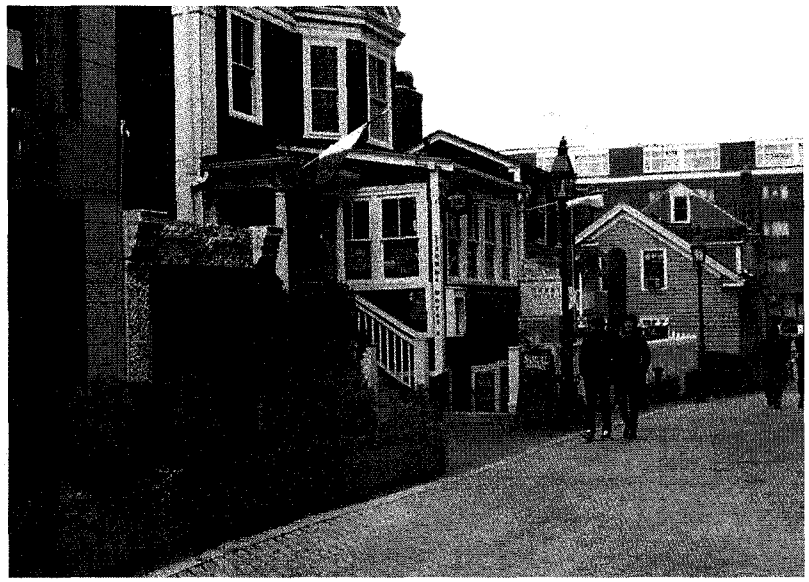


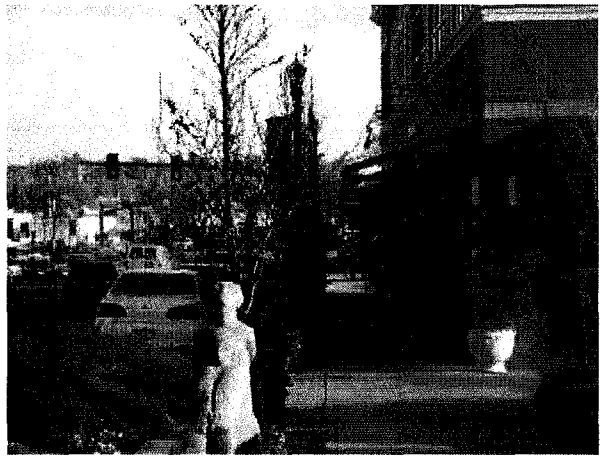
What could have been



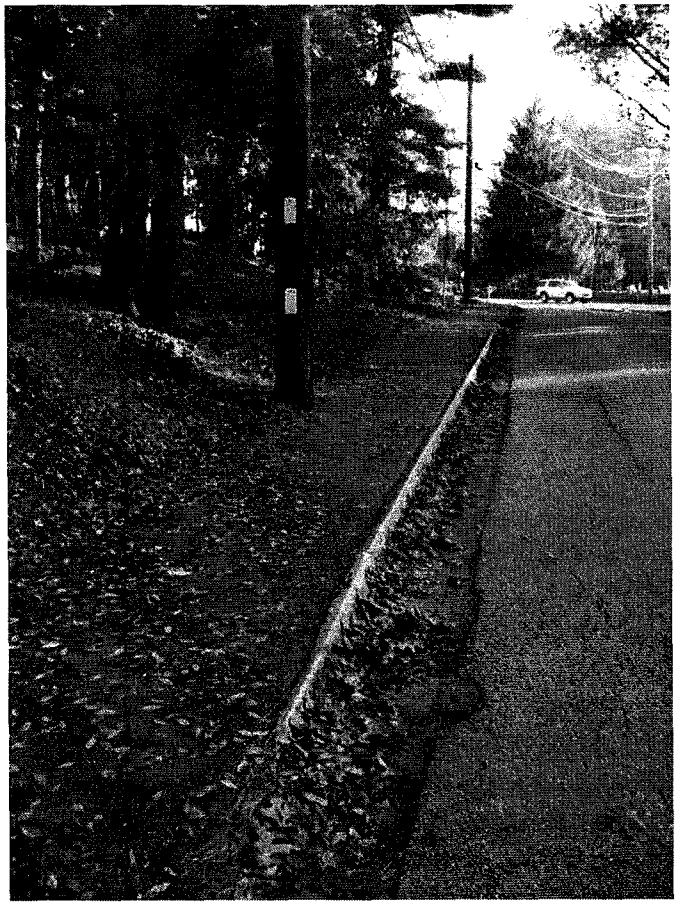
Well-designed sidewalks make a Village more desirable



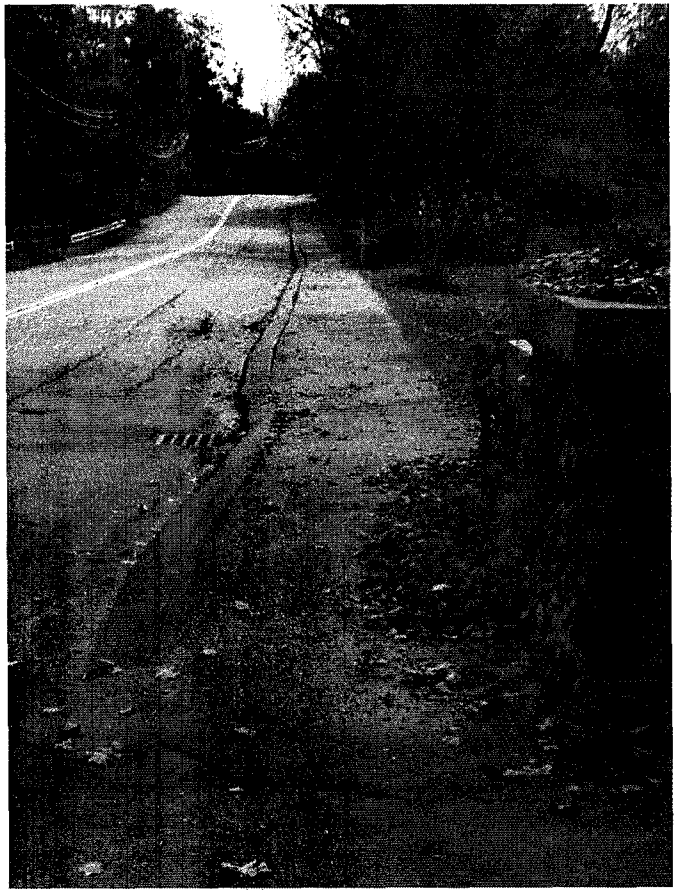




Contrasting curb materials separate the sidewalk from the road



Cut granite curb and asphalt sidewalk



Asphalt curb blends in with road:
less safe, less attractive

Alternatives to grass can be attractive and environmentally beneficial

Acton Sidewalk Guidelines – Issues Checklist

Sidewalk Width

A sidewalk width of 5' is needed for two adult pedestrians to comfortably walk side-by-side, and in most circumstances 5' should be considered the minimum sidewalk width for local or collector streets.

Summary of general width guidelines:	
Local or collector streets	5'
Arterials or other major streets	6' – 8'
Along parks, schools, and other major pedestrian generators	8-10'

Exceptions – when a narrower sidewalk (down to 4') may be appropriate:

- In order to preserve healthy trees or other natural landmark
- In order to preserve room for a planting strip

Sidewalk Landscape Buffer

Planting areas should be provided adjacent to all sidewalks except in cases where physical constraints prohibit such a configuration. On local or collector streets a minimum width is generally 2', but wider or varied width buffers (i.e. meandering sidewalk) should be considered when space allows. Allow a minimum 4' width if planting trees.

Planting materials should be chosen which provide visual interest, support the local ecology, require little or no watering or maintenance, and make the pedestrian experience more pleasant. Care should be taken to choose plants whose growth will not create obstructions for the pedestrian nor damage the sidewalk (as certain tree roots may do). Grass is generally the easiest and least expensive to install but may be harder to maintain over time where mowing is difficult, such as on slopes or near walls. Alternatives should be considered, especially when caretakers can be identified who can provide plants and/or who will care for the area until plants are established (i.e. the property owner or a neighborhood group).

Examples:

- Trees will provide shade and, if placed between the sidewalk and the road, an additional level of pedestrian protection. Shaded surfaces may be 20–45°F (11–25°C) cooler than the peak temperatures of unshaded materials.[1]
- A mix of native, low-growing ground covers will provide an alternative to grass that will not need mowing nor other frequent attention to survive and remain attractive. Flowers and leaves from native plants will also provide food and habitat for insects that contribute to the natural life cycle of butterflies, birds, and bees, and therefore play indispensable roles in the health of our environment.[2]
- The nature of the planting materials should be in keeping with the site. Grass or compact shrubs may be more in keeping with a commercial district or town center, to highlight an important architectural landmark, or to complement the nature of adjacent plantings. Wildflowers and grasses may be suitable for certain residential areas and more open landscapes. Larger shrubs can be placed to block undesirable views while not obstructing important sight lines or snow clearing.

See Appendix A for planting guidelines and tree, shrub, and ground-cover suggestions suitable for roadway conditions.

Sidewalk Construction Materials

The ultimate goal is for the new sidewalk to look like it belongs in that location.

Walkway

Bituminous asphalt is an appropriate surface for many areas. It is less expensive than many alternatives, as well as being more environmentally efficient to produce and maintain.

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[1] US Environmental Protection Agency, Heat Island Effect, See: http://www.epa.gov/heatisland/mitigation/trees.htm

[2] According to Douglas Tallamy, in *Bringing Nature Home; how native plans sustain wildlife in our gardens* (Timber Press, Portland, OR c 2007) one hour of mowing produces the same pollution as 650 miles driving (p. 118). Preliminary studies show that native plants support between four and 35 times more insects than alien plants (p. 54).

Exceptions -
When a new sidewalk is being constructed to connect to existing sidewalks. In that case, the existing materials in place should be the guideline for the new sidewalk. In most cases, the alternative material will be concrete. Consistency of material choices is a key component in insuring an overall town appearance that is welcoming and appears well cared for.

Curb or Berm

An asphalt berm is a very cost-effective option when the roadway and sidewalk is fairly straight and when there is at least a 2' planting strip. Where the planting strip is wide or raised above street level, there may be no need for a curb at all.

Exceptions: Choice of curb or berm materials should take into consideration:

- Pedestrian Safety

  Granite curbs are used to improve safety on sharp turns by making it less likely that a car will stray onto the sidewalk. In this case a vertical granite curb may be most appropriate.

  Contrasting curb materials help to visually distinguish the sidewalk from the road, which is especially important when there is no room for a planting strip and/or when the sidewalk material itself is bituminous asphalt. A granite curb, whether sloped or vertical, will clearly demarcate the edge of the roadway from the beginning of the pedestrian environment.

- What's Already There

  Final choice of materials should consider what is already in place – existing sidewalks, the adjacent buildings and walkways leading to the sidewalk, stone walls or gates, etc. A granite curb material may be appropriate to complement the stone of an adjacent wall or formality of adjacent buildings.

Lighting

Sidewalks should be illuminated where there is a safety concern. Additionally, any areas that have (or anticipate) high night-time pedestrian traffic should be illuminated, for public safety and convenience. Generally, sidewalks will *not* be illuminated; just as most roads are not illuminated and cars have headlights to drive at night, citizens may need to provide their own lighting for using town sidewalks after dark.

Additional sidewalk lighting may be desirable for reasons other than safety, such as ambience in one or more of the town villages, to encourage shopping or dining, security of buildings, or to display the beauty of town buildings and public spaces at night. The existence, placement, and style of that lighting is beyond the scope of these recommendations.

Guidelines for Road Types:

- Where a sidewalk is routed across an **arterial road,** the crosswalk should be illuminated so that drivers can see pedestrians.
- The Acton Municipal Properties Department should be asked for a recommendation on whether to light a crosswalk over a **collector road**; they will consult with other town government bodies as appropriate, such as the police and fire departments, Planning and Engineering Departments, and the Board of Selectman.
- Crosswalks over **local roads** generally need not be lit.

Implementation of lighting should follow recommendations by the town, with due consideration for placement, visibility, energy efficiency, cost, operations and maintenance, color rendering, outdoor light pollution, neighbor concerns, etc. The currently recommended default lighting over crosswalks for safety (as discussed above) is 50-100 Watt Metal Halide lights with a flat lens. This lighting may vary for extraordinary circumstances, for example, neighbor concerns, proximity to a public park, or lighting in an historic district.

Hours of Operation of sidewalk and crosswalk lighting is similarly left to the town government.

Environmental Impact Considerations

Materials choice

Sidewalk construction materials other than bituminous asphalt or concrete should be considered where feasible to protect environmentally sensitive areas (i.e. wetlands) or to reduce stormwater runoff. For instance:

- **Pervious Paving**
  Pervious paving includes porous asphalt, pervious concrete, paving stones, manufactured grass/gravel pavers. Advantages in sidewalk situations can include retention of water for trees and other plant life, protection of streams and water supply, groundwater recharging, capturing of some pollutants, and removal of some pollutants. Use requires deep permeable soils and proper site preparation. Some estimates of installation cost indicate 20-25% above standard asphalt. Maintenance through industrial vacuuming or high pressure hosing is required. Clogging may occur if improperly installed or inadequately maintained and if sand is used in winter. Drainage through pervious paving does not occur when the ground is frozen. Effects of freeze-thaw cycle which may damage the paving can be ameliorated through appropriate installation. It is possible that anaerobic conditions may develop in underlying soil which may interfere with microbiological decomposition. Because there is some risk of groundwater contamination, installation near groundwater drinking supplies is not considered advisable until further scientific data becomes available.

- **Rubber**
  Rubber sidewalks are a modular form of pervious paving which are particularly useful around tree roots where concrete and asphalt tend to fail after 5-7 years. Use of rubber sidewalks can mitigate the heat island effect of other paved services. They are delivered in 2 x 2.5' interlocking tiles allowing for either a 4' or 5' wide sidewalk. They last for 20-30 years and have been used in cold weather climates such as Alaska and Canada where they have been plowed using sidewalk snowplows. They are made with 100% recycled tire crumb rubber and waste plastic, meet all requirements of sidewalk-worthiness, including stable grade, non-vibration in compliance with ADA requirements, and high coefficient of friction for non-skid both dry and wet.

  Materials cost is comparable to asphalt but there are additional labor costs associated with preparing the ground for installation.

See Appendix B for further information

Landscaping

Planting design and plant choices for areas surrounding sidewalks and streets play a big role in the overall appearance and environmental impact of the sidewalk installation or new development. Trees and other landscaped areas near streets, sidewalks, and parking lots can reduce stormwater runoff and adverse impacts to water resources. Trees and vegetation intercept rainfall, and the exposed soils associated with plants absorb water that will be returned to ground water systems or used by plants.

In particular:

- Rain Gardens can be installed along sidewalks to mitigate stormwater runoff and to provide an attractive pedestrian experience. Weeding will be required in the first year or so until plants get established.
- Use of native plants and shrubs help restore our natural ecosystems and help insure the survival of the full range of wildlife native to our area.

See Appendix B for detailed list of native plants appropriate for different conditions.

Accessibility for People with Disabilities

Sidewalks present unique challenges to accessibility for which specific guidance is considered essential. When designing sidewalks, the Town of Acton recommends that developers refer to http://www.access-board.gov/prowac/ for guidance to ensure that sidewalks and pathways are accessible to persons with disabilities. This website addresses various issues including access for blind pedestrians, wheelchair access, and various constraints posed by space limitations, roadway design, slope, and terrain. The guidelines cover pedestrian access to sidewalks and streets, including crosswalks, curb ramps, street furnishings, pedestrian signals, parking, and other components of public rights-of-way.
See Appendix B for links to design guidelines and illustrations

Obstacles

The distance to the bottom of signs placed in or next to a sidewalk should be at least 7' above the sidewalk surface to avoid injury to pedestrians. Guy wires and utility tie-downs should not be located in or across sidewalks at heights below 7'.

Curb Cuts

There should be only one curb cut for businesses with less than 100' frontage and a maximum of two curb cuts for businesses with wider frontages. In general, curb cuts should be no wider than 30'.

Addendum A Landscape Guidelines

TREE PLANTING

For more detailed information on tree planting guidelines see Fed Hwy Administration: http://www.fhwa.dot.gov/environment/sidewalk2/sidewalks204.htm#the1) section 4.4

1. Plant trees whose roots tend to grow down rather than out or use root control systems to guide the direction of root growth;
2. Use tree gratings or planting strips to allow enough water to reach the tree roots;
3. Avoid planting trees near intersections because they may decrease visibility between pedestrians and drivers;
4. Trim tree branches regularly to avoid having protruding branches lower than 2.03 m (80 in);
5. Place trees far enough apart for roots and trunk to grow and provide open space for food, air, and water.

PLANTING LIST SUGGESTIONS

Trees (note: this list still needs to be reviewed, with additional info added – mature height, leaf color during different seasons, flowers, sun/shade/soil requirements)

- Little leaf linden – fragrant flowers, elegant form, nice summer shade, tolerant of compaction and urban conditions.
- Red maple – native small tree works well for confined areas, shallow roots are helpful in areas with underground utilities, delicate fall foliage.
- Zelkovas – vase shape with elm-like leaves but not of elm stature. Hardy. High limbs so easy to work under and does not require trimming.
- Oaks – native, tolerant of soil disturbance. Large-scale so fewer trees needed for effect. Oaks are listed as one of the "biodiversity all stars" by Bill Cullina of the New England Wild Flower Society, supporting nearly 500 species of moths and butterflies and providing nesting cavaties for birds and mammals as well as food for many other animals. (see http://www.newfs.org/publications-and-media/articles/the-biodiversity-all-stars.html/)

Shrubs (consider overall size, pruning and other maintenance needs, salt tolerance)

Ground Covers (consider height, aggressiveness, walkability, drought and salt tolerance)

Addendum B Internet Resources

Topic	Link	Comments
Pervious Paving		
	http://www.concretenetwork.com/pervious/	Multiple links to information about pervious concrete paving
	http://www.boston.com/news/local/massachusetts/articles/2008/10/26/pavement_thats_porous_gains_ground/?page=2	Oct 26, 2008 Boston Globe article about growing use of porous pavement in Northeast projects.
	http://www.mapc.org/regional_planning/LID/permeable_paving.html	Metropolitan Area Planning Council
	http://water.wikia.com/wiki/Permeable_paving	Wikipedia definition
	http://www.cityofboston.gov/environment/pdfs/hpb_guidelines.pdf	Boston sustainable design guidelines include pervious paving
Rubber sidewalks		
	http://www.rubbersidewalks.com/default.aspx	Sole source manufacturer of modular pervious paving using recycled materials. Contact Dan Joyce: danjoyce@rubbersidewalks.com, 714-964-1400.
Federal Standards		
	http://www.fhwa.dot.gov/environment/sidewalk2/contents.htm	
General Design guideline examples		
	http://www.allstonbrightoncdc.org/pdfs/Green%20Streets%20Guide%20for%20Allston%20Brighton.pdf	Guidelines for new Allston/Brighton development. Includes useful before and after pictures as well as landscape options for reducing stormwater runoff
	http://www.ci.minneapolis.mn.us/public-works/trans-plan/DesignGuidelines_StreetsSidewalks_022708.pdf	Feb 2008 Design Guidelines for Streets and Sidewalks in Minneapolis
Environmental Considerations		Reducing heat islands, using recycled materials, promoting value of native plants, using raingardens to reduce stormwater runoff
	http://www.pavement.com/Downloads/RT/RT3.05.pdf	Strategies for reducing heat island effect of paved surfaces
	http://eetd.lbl.gov/HeatIsland/	ditto
	www.epa.gov/heatisland	Impact of heat islands, mitigation strategies, and other resources
	http://www.buildinggreen.com/menus/drillBC.cfm?BuilderCategoryID=14	Green products and strategies related to sitework and landscaping
	http://www.mass.gov/envir/smart_growth_toolkit/pages/CS-lid-acton-new.html	Acton Discovery Museum case study in low-impact development including pervious paving

Topic	Link	Comments
	http://bringingnaturehome.net/native-gardening	Includes native plant list for East coast suburban landscape. Data on importance of landscape choices for preserving biodiversity and the health of our ecosystem.
	http://www.newfs.org/publications-and-media/articles/the-biodiversity-all-stars.html/	Discussion of top native plants for supporting biodiversity, by Bill Cullina for the New England Wildflower Society
	http://www.mass.gov/Eoeea/docs/eea/water/raingarden.pdf	Rain gardens including list of MA appropriate plants for different conditions.
	http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Natural_Drainage_Systems/Street_Edge_Alternatives/SPU_001805.asp	Rain Gardens for Storm water management. Seattle Street Edge Alternatives (SEA Streets) Profject.
Grass alternative planting materials and "no-mow" grass		
	www.stepables.com	Commercial nursery specializing in walkable groundcovers
	http://classygroundcovers.com/	Commercial nursery specializing in bulk orders for groundcovers. Useful images.
	http://www.prairienursery.com/store/index.php?cPath=11&main_page=index	Low maintenance turf mix for sun or partial shade. Once established, requires little or no watering or fertilizing and limited or no mowing.
Traffic calming		
	http://seedmagazine.com/news/2006/12/where_the_sidewalk_ends.php?page=all	
	http://www.pps.org/info/placemakingtools/casesforplaces/livememtraffic#WIDENING%20SIDEWALKS/NARROWING%20STREETS%20AND%20TRAFFIC%20LANES	
	http://www.walkinginfo.org/engineering/calming.cfm	
	http://www.pedbikeimages.org/category_front.cfm?categoryId=67	Pedestrian and bicycle information center image library
Accessibility		
	http://www.fhwa.dot.gov/environment/sidewalks/chap4a.htm	Federal Highway Administration. Guidelines for urban areas. Helpful illustrations for how to create accessible sidewalks.
	http://www.access-board.gov/prowac/alterations/guide.htm	United States Access Board, design guidance for rights of way including sidewalks